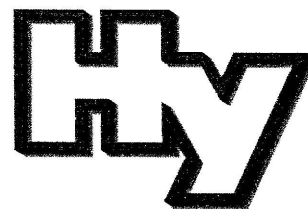


# Hygiene-Institut des Ruhrgebiets

Institut für Umwelthygiene und Toxikologie  
Direktor: Prof. Dr. rer. nat. L. Dunemann



HYGIENE-INSTITUT · Postfach 10 12 55 · 45812 Gelsenkirchen / GERMANY

Düker GmbH & Co. KGaA  
Hauptstr. 39-41  
63846 Laufach  
GERMANY

Visitor-/Parcel Address:  
Rotthäuser Str. 21  
45879 Gelsenkirchen

Telephone +49 (0) 209 9242-0  
Extension +49 (0) 209 9242-210  
Telefax +49 (0) 209 9242-212  
E-Mail a.koch@hyg.de  
Internet www.hyg.de

Reference-No.: K-204514-11-Ko/st  
Contact person: Dr. Andreas Koch  
Redraft: K-202985-11-Ko/st

Gelsenkirchen, 21.06.2011

## TEST CERTIFICATE

in accordance with the KTW-Recommendations  
of the Working Group "Trinkwasserbelange" of the  
Kunststoff-Kommission des Bundesgesundheitsamtes  
(Plastics Commission of the German Federal Agency)  
and according to DIN 51178 "physiological harmless"

**Order of:** 15.03.2006 (reference: VE/JM)

**Application:** drinking water "ancillaries"

**Test Material:** ENAMEL G 3394/SB (cobalt blue)

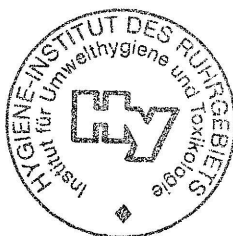
**Specimen:** plates of cast iron with enamel coating  
100 mm x 100 mm x 9 mm

**Date of receipt:** 20.03.2006

**Date of performance of  
the test:** (experimental) 28.04.2006 to 08.05.2006

The Director of the Hygiene-Institute  
on behalf of

Dr. rer. nat. Andreas Koch  
Head of the Dept. for water  
hygienic material testings



This test certificate is valid beginning with the date of issue and is ending by **06.06.2016**, as far as there are no changes in the formula.

This test certificate consists of 3 pages.

The assessment was based on the assumption that the used starting substances and monomers used to manufacture the product may completely known and no other substances are present in the product. The validity of this document expires in case of modifications in the composition of the product or the processing conditions. The results and evaluations refer to the groups of test items. This document may not be published without our written permission only complete and unchanged or duplicated.



**Test Method:**

Plates of cast iron with enamel coating G 3394/SB (cobalt blue) were tested according to the methods published by the Working Group "Trinkwasserbelange" (Drinking Water Affairs) of the Plastics Commission of the German Federal Health Agency ("Assessment of plastics and other non-metallic materials from the hygienic point of view in the scope of the Law for Foodstuffs and Requirements for the Drinking Water Area", Bundesgesundheitsblatt, Vol. 20, 1977, page 124 ff.).

Following DIN 51178 "Vitreous and porcelain enamels – inside and outside enamelled valves and pressure pipe fittings for untreated and potable water supply" the test waters of the parallel test were examined with regard to total organic carbon (TOC), lead and cadmium.

The test results are tabulated on page 3.

**Assessment:**

The release of organic compounds, measured by the sum parameter "total organic carbon" TOC, in the relevant 3<sup>rd</sup> migration period is lower than the detection limit of 1 mg/m<sup>2</sup> x day (the limit value for ancillaries is 15 mg/m<sup>2</sup> x day). The release of lead and cadmium lies also below the detection limit. The surface values meet the requirements for enamel used in the drinking water area. The concentrations of the parameters in the test water are significantly lower than the limit values in each case. Based on the test results there is no objection against the use of the enamel G 3394/SB (cobalt blue) for the internal coating of ancillaries (valves, fittings) from the hygienic point of view.

АРМАЦЕНТР

**Test of the physiological harmlessness  
 following DIN 51178 paragraph 4.5  
 (in accordance to the KTW-Recommendations)**

**cold water test (23 °C)**

**Test material:** EMAIL G 3394/SB (cobalt blue)

Test conditions:

coated surface (enamel): 900 cm<sup>2</sup>  
 test water: 1000 ml  
 test period: 28.04. to 08.05.2006 (3 times for three days subsequently)  
 pre-treatment: 24 hours prewashing, 2 hours rinsing  
 Application: drinking water "ancillaries"

Parameter		test water			control water
		1.-3. day	4.-6. day	7.-9. day	
total organic carbon (TOC)	mg/l	<0,1	<0,1	<0,1	<0,1
lead (Pb)	mg/l	<0,001	<0,001	<0,001	<0,001
cadmium (Cd)	mg/l	<0,001	<0,0001	<0,0001	<0,0001
		coating area values: enamel			limit
total organic carbon (TOC)	mg/m <sup>2</sup> x day	<1	<1	<1	15,0
lead (Pb)	mg/m <sup>2</sup> x day	<0,01	<0,01	<0,01	0,3
cadmium (Cd)	mg/m <sup>2</sup> x day	<0,001	<0,001	<0,001	0,03

The test results are arithmetic means of two parallel tests.

## Deutsche Akkreditierungsstelle GmbH German Accreditation Body

Entrusted according to Section 8 subsection 1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV

Signatory to the Multilateral Agreements of EA, ILAC and IAF for Mutual Recognition

# Accreditation



The Deutsche Akkreditierungsstelle GmbH (German Accreditation Body) attests that the testing laboratory

**Hygiene-Institut des Ruhrgebiets  
Institut für Umwelthygiene und Umweltmedizin  
Rotthausen Straße 19, 45879 Gelsenkirchen**


is competent under the terms of DIN EN ISO/IEC 17025:2005 to carry out tests in the following fields:

Physical, physicochemical, chemical, biological and specific ecotoxicological analyses of water, surface water, natural water, leachate, swimming pool water, waste water, sludge, sediments, solid wastes, matters for recycling and soils; microbiological analyses of water, surface water, swimming pool water as well as mineral and table water; analyses of drinking water as specified by the Trinkwasser-verordnung (German drinking water ordinance) from 2001 excluding radiological parameters; specific physicochemical, chemical and microbiological analysis of non-metallic materials in potable water supply; specific microbiological examination of disinfectants and materials; analyses of organic trace elements in water, aqueous migrates and plastics by means of HPLC-MS; analyses of organic trace elements in water, aqueous migrates and solid matters (i.a. plastics) by means of gas chromatography (GC-MS); sampling of water, natural, potable and waste water, leachate, swimming pool water, water from aquifers and flowing water bodies, soil vapour and sludges; determination (sampling and analysis) of airborne organic gaseous particles, fibrous particles and microbiological substances within the frame of indoor measurements; determination (sampling and analysis) of airborne fibrous particles within the frame of measurements at workplace; determination (sampling and analysis) of particle precipitations within the frame of immission measurements; analysis of solid matters and dust with regard to fibrous particles; determination (sampling and analysis) of inorganic and organic gaseous or particulate air constituents in immission; determination (sampling and analysis) of fibrous particles in immission; sampling of airborne polyhalogenated Dibenzo-p-Dioxins and Dibenzofuranes in immission; modul immission control; technical modules water, soil and contaminated sites as well as waste

The accreditation certificate shall only apply in connection with the notice of accreditation of 12.11.2010 with the accreditation number D-PL-13042-02 and is valid until 18.06.2014. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 66 pages.

Registration number of the certificate: D-PL-13042-02-00

Berlin, 12.11.2010

  
Andrea Valbuena  
Head of Division

This document is a translation. The definitive version is the original German accreditation certificate.

See notes overleaf.

# ZERTIFIKAT

LW-BU0440

## über die Anerkennung als DVGW-Prüflaboratorium

*Das Prüflaboratorium*

**Hygiene-Institut des Ruhrgebiets -Umwelthygiene-  
Rotthauer Str. 19, 45879 Gelsenkirchen  
DEUTSCHLAND**

*ist als*

### **DVGW-Prüflaboratorium Wasser**

*anerkannt und damit berechtigt, Produktprüfungen für die DVGW CERT GmbH in dem bescheinigten Bereich durchzuführen. Die Anerkennung ist an die Person der Leitung des Prüflaboratoriums bzw. dessen Stellvertretung gebunden.*

Leitung des Prüflaboratoriums: **Dr. rer. nat. Andreas Koch**

Stellvertretung: **Dr. rer. nat. Georg-Joachim Tuschewitzki  
Dr. rer. nat. Christiane Schell**

Die Anerkennung gilt nur in Verbindung mit der gültigen Anlage zum anerkannten Prüfumfang, sowie der aktuellen Geschäftsordnung zur DVGW-Zertifizierung von Produkten. Sie gilt bis zum 04.01.2015, sofern die Voraussetzungen, die zur Anerkennung geführt haben, unverändert bleiben. Die Erstankennung erfolgte am 04.01.2010.

13.01.2010

Datum, Bearbeiter, Brutt. Leiter der Zertifizierungsstelle

DVGW CERT GmbH - allgemein anerkannte Zulassungsstelle für die Prüflaboratorien im Gas- und Wasserfach

*DVGW CERT GmbH - commonly recognized approval body for testing laboratories in the German gas and water industry*

DVGW CERT GmbH

Josef-Wirmer-Straße 1-3  
53123 Bonn

Telefon: +49 228 91 88-888

Telefax: +49 228 91 88-993

eMail: [info@dvgw-cert.com](mailto:info@dvgw-cert.com)